Exercise Chain of Responsibility Pattern

Implement an online parcel shipping system. The parcel rates depend on the package size and their weight.

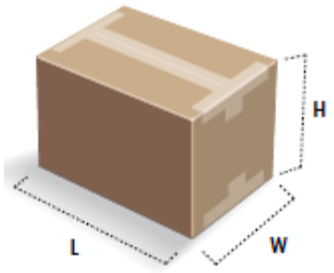

Fig. 1: Package dimensions: Length x Width x Height
Source https://www.ups.com/assets/resources/media/en_US/daily_rates.pdf p. 16

Shipment types	Weight kg	Dimensions (L x W x H) cm	Price €
Domestic Small	up to 2 kg	up to 30 x 30 x 15	4,25
Domestic Large	up to 5 kg	up to 60 x 30 x 15	6,75
European Union	up to 10 kg	up to 80 x 60 x 100	10,50
International	up to 70 kg	up to 150 x 60 x 70	30,-

Tab. 1: Shipping rates

1. Implement a Java class hierarchy according to the Chain of Responsibility Pattern. Fig. 2 shows an incomplete UML class hierarchy.

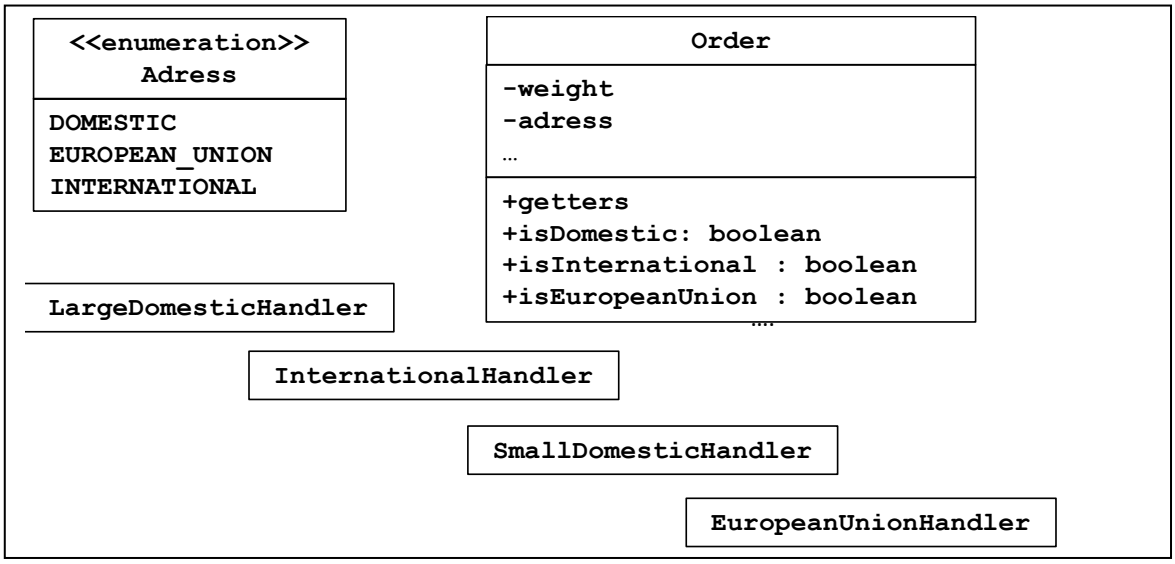

Fig. 2: UML class hierarchy (incomplete)

A possible console output of one chain example might look like this:

```
Order [Weight=1.5 kg, L=15 cm, W=25 cm, H=10, DOMESTIC]
         handled by SmallDomesticHandler

Order [Weight=35.0 kg, L=76 cm, W=50 cm, H=70, INTERNATIONAL]
         handled by InternationalHandler

Order [Weight=4.5 kg, L=48 cm, W=19 cm, H=9, DOMESTIC]
         handled by LargeDomesticHandler

Order [Weight=9.5 kg, L=80 cm, W=50 cm, H=100, EUROPEAN_UNION]
       handled by EuropeanUnionHandler

Order [Weight=3.5 kg, L=17 cm, W=30 cm, H=15, DOMESTIC]
         handled by LargeDomesticHandler
```

2. How is the following Order processed:

```
Order  [Weight=29.5 kg, L=26 cm, W=30 cm, H=15, DOMESTIC]?
```

   a.) Design a reasonable strategy
   b.) **Optional**: extend your implementation.

3. **Optional**: The processing chain should be extended by stamp handlers, which put stamps on each package. Only three stamp values exist: 0,50 €, 0,25 € and 1 €. Apply the chain of responsibility pattern again and extend your implementation in the following way:

```
Order [Weight=1.5 kg, L=15 cm, W=25 cm, H=10, DOMESTIC]
       handled by SmallDomesticHandler stamped with 4 x 1€ 1 x 0,25€
```